CLAIMS

1. A thermal processing apparatus that conducts a thermal process to an object to be processed at a temperature of 400°C or more, the thermal processing apparatus comprising:

a processing vessel having a transmitting window in a top part thereof;

a table disposed in the processing vessel, the table supporting thereon the object opposed to the transmitting window;

a plurality of heating lamps disposed on above the processing vessel, the lamps heating the object by irradiating heat rays to the object through the transmitting window; and

a thermoelectric converter disposed on the table and configured to at least cool the object.

2. The thermal processing apparatus according to claim 1, wherein

a heat-medium jacket containing a heat-medium flow path is disposed below the thermoelectric converter.

3. The thermal processing apparatus according to claim 1, wherein

the thermoelectric converter is configured to heat the object by applying thereto an electric current in an opposite direction when the object is cooled.

4. The thermal processing apparatus according to claim 1, wherein:

the thermoelectric converter includes a plurality of thermoelectric transducers arranged in their respective zones of the table; and

the thermal processing apparatus further comprises a transducer controller configured to control electric currents to be applied to the thermoelectric transducers for each zone of the table independently.

5. The thermal processing apparatus according to claim 4, wherein

the transducer controller intermittently applies the electric currents to the thermoelectric transducers, and measures temperatures of the thermoelectric transducers based on electromotive forces of the thermoelectric transducers while no current is applied thereto.

6. The thermal processing apparatus according to claim 1, wherein:

the object to be processed is a silicon wafer;

the plurality of heating lamps includes an ultraviolet discharge lamp that mainly irradiates an ultraviolet ray and a halogen lamp that mainly irradiates a visible ray.

7. The thermal processing apparatus according to claim 6, wherein

the electric power of the ultraviolet discharge lamp is duty-controlled.

8. The thermal processing apparatus according to claim 6, wherein

a center portion of the object is mainly irradiated with the ultraviolet ray from the ultraviolet discharge lamp, and a peripheral portion of the object is mainly irradiated with the visible ray from the halogen lamp.

9. A thermal processing apparatus that conducts a thermal process to an object to be processed at a high temperature, the thermal processing apparatus comprising:

a processing vessel having a transmitting window in a top part thereof;

a table disposed in the processing vessel, the table supporting thereon the object opposed to the transmitting window; and

a plurality of heating lamps disposed above the processing vessel, the lamps heating the object by irradiating heat rays to the object through the transmitting window; wherein

the table includes an absorbing plate that mainly absorbs the heat rays of a kind mainly irradiated from the heating lamps.

10. The thermal processing apparatus according to claim 9, wherein

the table includes a plurality of absorbing plates that mainly absorb the heat ray of different kinds.

11. The thermal processing apparatus according to claim 10, wherein

a thermoelectric converter is disposed between the absorbing plates, the thermoelectric converter being configured to at least cooling a side thereof facing the object.